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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Ikuya Miyamoto

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EXAMINER

PEPITONE, MICHAEL F

ART UNIT

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1796

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/586,737	Applicant(s) MIYAMOTO ET AL.	
	Examiner MICHAEL PEPITONE	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/25/09.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 7-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 7-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/25/09</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/25/09 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3 and 7-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1-3 and 7-10: It is unclear if the text within the parentheses in claims 1 and 10 {line 15, values of n and m for the non-ionic surfactant} is included in the claims and further limits the subject matter of the claims, or whether it is an aside to the claims and is not further limiting. For the purpose of further examination, it is taken that the text within the parenthesis further limits the claims. Accordingly dependent claims 2-3 and 7-9 are indefinite.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada *et al.* (WO 03/022927) in view of Takahashi *et al.* (US 6,238,793). For the purpose of examination, Yamada *et al.* (US 2005/0043462) was used as the English translation of Yamada *et al.* (WO 03/022927).

Regarding claims 1-3 and 8: Yamada *et al.* teaches a composite material, and molded object, (¶ 1, 59, 62-63) comprising polylactic acid (¶25, 102); a phyllosilicate organically modified with an onium salt (¶28-32), specifically dihydroxyethyl methyl ocatadecyl ammonium chloride (¶ 31-32) {note SOMASIF MEE (dihydroxyethylmethyldodecyl ammonium chloride (¶ 102)) [instant claims 2-3] (¶ 31-32, 102), in an amount of 0.1 to 20 parts by weight {based on

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100 parts polylactide} (§ 29); and a compatibilizer comprising a polyethylene glycol having one terminal containing alkoxy groups (§ 34-35) in an amount of 0.01 to 10 parts by weight {based on 100 parts polylactide} (§ 39). Yamada *et al.* teaches a specific embodiment comprising 100 parts polylactic acid, 4 parts SOMASIF MEE, and 0.5 parts compatibilizer {PEG mono-ether} (§ 102) {PEG mono-ether substituted for PCL200 (§ 34-36)}.

While the specific embodiment does not disclose 2 to 40 parts of compatibilizer (using 4 parts of phyllosilicate example 1) {corresponding to 50 to 1000 parts based on 100 parts layered silicate}, Yamada *et al.* teaches the compatibilizer can be employed in an amount of 0.01 to 10 parts by weight {10 parts compatibilizer per 4 parts phyllosilicate equivalent to 250 parts compatibilizer per 100 parts phyllosilicate}. At the time of invention a person of ordinary skill in the art would have found it obvious to have used up to 10 parts by weight compatibilizer, and would have been motivated to do so since Yamada *et al.* suggest up to 10 parts by weight provides improvement of the dispersibility of the phyllosilicate in the biodegradable polyester resin {polylactic acid} (§ 34, 39).

Yamada *et al.* does not teach a specific polyoxyethylene alkyl ether surfactant of claim 1. However, Takahashi *et al.* teaches a thermoplastic composites comprising lamellar silicates (1:10-24) and non-ionic surfactants {polyethyleneglycol oleyl ether, degree of polymerization $n=2\sim50$; alkyl group = C_{18} ; polyethyleneglycol lauryl ether, degree of polymerization $n=2\sim50$; alkyl group = C_{12} } (3:55-65). Yamada *et al.* and Takahashi *et al.* are analogous art because they are concerned with a similar technical difficulty, namely the preparation thermoplastic composites comprising silicates and non-ionic surfactants. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined polyethyleneglycol alkyl

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ethers {degree of polymerization $n=2\sim 50$; alkyl group = $C_{12}-C_{18}$ }, as taught by Takahashi *et al.* in the invention of Yamada *et al.*, and would have been motivated to do so since Takahashi *et al.* suggests that such non-ionic surfactants are ideal for thorough dispersing of lamellar silicates in a thermoplastic resin, resulting in a transparent composite (1:10-17).

Regarding claim 7: Yamada *et al.* teaches a food tray (§ 115), and blow molded bottle {stretched film} (§ 116).

Regarding claim 7: Yamada *et al.* teaches about 4.3 wt% of phyllosilicate and compatibilizer {as calculated by examiner} (§ 102).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada *et al.* (WO 03/022927) in view of Takahashi *et al.* (US 6,238,793). For the purpose of examination, Yamada *et al.* (US 2005/0043462) was used as the English translation of Yamada *et al.* (WO 03/022927).

Regarding claims 10: Yamada *et al.* teaches a composite material, and molded object, (§ 1, 59, 62-63) comprising polylactic acid (§ 25, 102); a phyllosilicate organically modified with an onium salt (§ 28-32), specifically dihydroxyethyl methyl ocatadecyl ammonium chloride (§ 31-32) {note SOMASIF MEE (dihydroxyethylmethyldodecyl ammonium chloride (§ 102))} [instant claims 2-3] (§ 31-32, 102), in an amount of 0.1 to 20 parts by weight {based on 100 parts polylactide} (§ 29); and a compatibilizer comprising a polyethylene glycol having one terminal containing alkoxy groups (§ 34-35) in an amount of 0.01 to 10 parts by weight {based on 100 parts polylactide} (§ 39). Yamada *et al.* teaches a specific embodiment comprising 100 parts

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polylactic acid, 4 parts SOMASIF MEE, and 0.5 parts compatibilizer {PEG mono-ether} (§ 102) {PEG mono-ether substituted for PCL200 (§ 34-36)}.

While the specific embodiment does not disclose 4 to 8 parts of compatibilizer (using 4 parts of phyllosilicate example 1) {corresponding to 100 to 200 parts based on 100 parts layered silicate}, Yamada *et al.* teaches the compatibilizer can be employed in an amount of 0.01 to 10 parts by weight {4-8 parts compatibilizer per 4 parts phyllosilicate equivalent to 100 to 200 parts compatibilizer per 100 parts phyllosilicate}. At the time of invention a person of ordinary skill in the art would have found it obvious to have used up to 10 parts by weight compatibilizer {specifically 4 to 8 parts}, and would have been motivated to do so since Yamada *et al.* suggest up to 10 parts by weight provides improvement of the dispersibility of the phyllosilicate in the biodegradable polyester resin {polylactic acid} (§ 34, 39).

Yamada *et al.* does not teach a specific polyoxyethylene alkyl ether surfactant of claim 10. However, Takahashi *et al.* teaches a thermoplastic composites comprising lamellar silicates (1:10-24) and non-ionic surfactants {polyethyleneglycol oleyl ether, degree of polymerization $n=2\sim50$; alkyl group = C_{18} ; polyethyleneglycol lauryl ether, degree of polymerization $n=2\sim50$; alkyl group = C_{12} } (3:55-65). Yamada *et al.* and Takahashi *et al.* are analogous art because they are concerned with a similar technical difficulty, namely the preparation thermoplastic composites comprising silicates and non-ionic surfactants. At the time of invention a person of ordinary skill in the art would have found it obvious to have combined polyethyleneglycol alkyl ethers {degree of polymerization $n=2\sim50$; alkyl group = $C_{12}\text{-}C_{18}$ }, as taught by Takahashi *et al.* in the invention of Yamada *et al.*, and would have been motivated to do so since Takahashi *et al.*

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suggests that such non-ionic surfactants are ideal for thorough dispersing of lamellar silicates in a thermoplastic resin, resulting in a transparent composite (1:10-17).

Yamada *et al.* teaches about 4.3 wt% of phyllosilicate and compatibilizer {as calculated by examiner} (§ 102). However, the phyllosilicate can be present in an amount of 0.1 to 20 parts by weight {based on 100 parts polylactide} (§ 29); and the compatibilizer in an amount of 0.01 to 10 parts by weight {based on 100 parts polylactide} (§ 39), wherein the total of phyllosilicate and compatibilizer corresponds to about 0.11 wt% to 23 wt%.

Alternatively, Yamada *et al.* teaches about 4.3 wt% of phyllosilicate and compatibilizer. Yamada *et al.* does not teach 4.5 wt% of phyllosilicate and compatibilizer. However, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) [See MPEP 2144.05].

Response to Arguments

Applicant's arguments with respect to claims 1-3 and 7 have been considered but are moot in view of the new ground(s) of rejection.

Takahashi *et al.* (US '793) was relied on for thermoplastic composites comprising lamellar silicates (1:10-24) and non-ionic surfactants {polyethyleneglycol oleyl ether, degree of polymerization n=2~50; alkyl group = C₁₈; polyethyleneglycol lauryl ether, degree of polymerization n=2~50; alkyl group = C₁₂} (3:55-65).

Regarding Applicant's arguments about employing the non-ionic surfactant disclosed in Takahashi *et al.* (US '793) {polyethylene system} into a polyester system, there are numerous

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factors that should be considered when choosing a dispersant for use in a polymeric matrix.

While the coefficient of friction of the polymer may be one such factor, the solubility parameters of the surfactant (correlated to the HLB {hydrophile/lipophile balance} of the surfactant) and the polymer should also be considered. Matching the solubility parameter of the surfactant {via correlation of the HLB of the surfactant} with the solubility parameter of the polymer ensures the surfactant is compatible with the polymer. Additionally, the Silva *et al.* publication {Journal of Hand Surgery} fails to compare the coefficient of friction of uncoated polyester to that of a polyethylene. The polyester was coated with polybutylate, and the polyethylene was a polyethylene/polyester composite {see methods/results}.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL PEPITONE whose telephone number is (571)270-3299. The examiner can normally be reached on M-F, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/
Supervisory Patent Examiner, Art Unit 1796